

**ADDITIONS TO VESPINE BIOLOGY VI: NOTES
ON VESPULA RUFa VAR. CONSOBRINA
SAUSSURE**

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During the last ten years I have occasionally observed the nests and habits of *Vespula rufa* var. *consobrina* Sauss. in Connecticut and Massachusetts. Since this variety of *V. rufa* is seldom discussed in the entomological literature, it seems worth while to record my observations on its nesting habits and life history.

Bequaert writes (1), "The var. *consobrina* extends across the American continent, being mainly an insect of the Canadian zone. In the Transition zone it is still fairly common, but it is much rarer in the Upper Austral". The abundance of colonies of this species shows a sharp change with a very small change in latitude. In four summers of fairly intensive collecting in Lakeville, Conn. ($41^{\circ}58'$ N.Lat., altitude 700 to 1800 feet) I have observed only one colony of var. *consobrina*. In two summers of equally intensive collecting in West Cummington, Mass. ($42^{\circ}30'$ N.Lat., altitude 1200 to 2000 feet) I have collected or encountered 14 colonies of var. *consobrina*. In Lakeville, the dominant ground dwelling Vespine is *V. maculifrons* Buy. In West Cummington, during the summer of 1947 the number of colonies of *maculifrons* and *rufa* var. *consobrina* was approximately equal, while the summer of 1948 (after a hard winter and a wet spring) revealed that *consobrina* colonies outnumbered *maculifrons* colonies by more than two to one. Thus at fairly comparable altitudes, a difference of only $0^{\circ}32'$ of latitude seems to result in an apparent reversal of species dominance.

R. P. Dow (2) has described a nest of *V. rufa* var. *consobrina* from Huntington, Mass. (about 18 miles south of West Cummington) which was located beneath the roots of mountain laurel. This nest was not attached to any supporting root or stone. My observations indicate that *consobrina* is almost exclusively a dweller of the forest floor, usually situated in old rodent burrows. The nests may or may not be protected by roots of trees or shrubs. In no instance have I seen the nest suspended or supported by a paper petiole.

It is not uncommon to find the comb and paper envelope of the nest buttressed against stones or roots near the bottom of the nest cavity. These steadying buttresses may extend from the earth halfway to the top of the nest. They are built of fairly heavy gauge

paper which projects outward and downward as a sheet, usually at right angles to the tangent of the curve of the nest.

A more or less typical colony was captured at West Cummington on August 23, 1948. It was located in the forest just off a little used dirt road. It was almost spherical in shape, located in a nest cavity whose lowest point was 20 cm. below the surface of the soil. The nest was 7.5 cm. in diameter. Unlike many other *Vespines*, the nest entrance was very large; an entrance 5 cm. in diameter was available at the bottom of the nest, where the envelope had never been completed. There were two tiers of worker brood comb, both 6 cm. in diameter. The nest envelope comprised six layers of paper. The envelope was made from horizontal strips of gray pulp, like the envelope of *Dolichovespula maculata* L. and quite unlike the envelope of *V. maculifrons*. Colonies of *V. maculifrons* within 100 meters of this nest built their envelopes of the typical yellowish pulp in the "clam shell" pattern, indicating that the two species actually select different raw materials for their paper. From the entrance to the nest cavity there extended a tunnel. This tunnel led 21 cm. along a gentle down slope, where it abruptly turned at right angles and extended another 29 cm. where it entered the nest cavity. The tunnel was unlined, having no paper tunnel built within, as is common among colonies of *V. squamosa* Drury. The colony contained 52 workers and the queen.

This colony was established in an outdoor cage near the laboratory where the wasps were allowed their freedom. They rebuilt the nest envelope in two days, but it was rebuilt from the periphery of the uppermost comb toward the center. The colony season terminated on October 8, 1948 when the population comprised 56 new queens, 8 males and 27 workers. Many queens had been leaving the nest on their mating flight during the previous week. No brood was left in the combs. The nest had been enlarged to 5 combs since August 23, it was 11 cm. tall, and the largest comb was 12 cm. in diameter. It is interesting that a colony of *V. maculifrons* from the same area closed its colony season during the same week.

Not all colonies of *consobrina* are founded underground in the woods. A healthy colony was seen in West Cummington located inside the wall of a house, about 12 feet from the ground. Access to the nest was gained through a loose clapboard. This was the only instance I have noted in which this species was not nested under the forest floor.

Among the 15 colonies of this species which I have seen, none

have exceeded a population of an estimated 200 individuals, which is fairly small compared with the usual colony population of other species of the genus.

All of the colonies of this species which I have kept in semi-captivity have been assiduous excavators. Ergates frequently remove lumps of earth and pebbles up to $\frac{2}{3}$ their own weight. When these colonies have been first placed in cages, they have all prepared two or more subterranean approaches to facilitate the removal of earth. When caged, they do not attempt to build a long tunnel, but make a short tunneled entrance in juxtaposition to the periphery of the nest. This indicates that the foundress queen selects her nest site in a remote corner of a rodent burrow. All the colonies which I have captured in the wild state have been located at the end of tunnels ranging from 30 to 60 cm. long.

This species is comparatively mild tempered. I have never been stung by it, even when intruding into its nest during daylight hours. On one occasion, a friend who was assisting in the capture of a colony was stung by an ergate who had escaped the effects of the anaesthetic, with the resulting normal symptoms of any Vespid sting.

In conclusion, *V. rufa* var. *consobrina* usually nests in the forest floor of the Canadian zone. Small differences in latitude may have a drastic effect on its relative abundance. Its nests are fairly small, located in old rodent burrows, and communicate with the outside by rather lengthy tunnels. The length of the colony season may be about equal to the colony season of other species of *Vespula* s. str.

BIBLIOGRAPHY

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2. **Dow, R. P.** The Nests of New England Wasps. *Bull. Boston Soc. Nat. Hist.* No. 56 p. 12. 1930.